

C 07/07/78

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)
DISTRIBUTION FOR INCOMING MATERIAL

50-335

REC: OREILLY J P
NRC

ORG: SCHMIDT A D
FL PWR & LIGHT

DOC DATE: 06/13/78
DATE RCVD: 07/03/78

DOCTYPE: LETTER NOTARIZED: NO

COPIES RECEIVED

SUBJECT:

LTR 1 ENCL 1

LICENSEE EVENT REPT #78-017 ON 5/14/78 CONCERNING IMPROPER SWITCHING AT THE PRATT & WHITNEY SUBSTATION COMBINED WITH INCORRECT WIRING OF PROTECTIVE RELAYS AT THE MIDWAY SUBSTATION LED TO THE DEENERGIZATION OF THE MIDWAY SUBSTATION RESULTING IN LOSS OF OFFSITE POWER TO THE SUBJECT FACILITY FOR ABOUT 3 1/4 MINUTES.

PLANT NAME: ST LUCIE #1

REVIEWER INITIAL: XRS

DISTRIBUTOR INITIAL: *u*

***** DISTRIBUTION OF THIS MATERIAL IS AS FOLLOWS *****

INCIDENT REPORTS
(DISTRIBUTION CODE A002)

FOR ACTION: BR CHIEF ORB#4 BC**W/4 ENCL

INTERNAL:

REG FILE**W/ENCL
I & E**W/2 ENCL
I & C SYSTEMS BR**W/ENCL
NOVAK/CHECK**W/ENCL
AD FOR ENG**W/ENCL
HANAUER**W/ENCL
AD FOR SYS & PROJ**W/ENCL
ENGINEERING BR**W/ENCL
KREGER/J. COLLINS**W/ENCL
K SEYFRIT/IE**W/ENCL

NRC PDR**W/ENCL
MIPC**W/3 ENCL
EMERGENCY PLAN BR**W/ENCL
EEB**W/ENCL
PLANT SYSTEMS BR**W/ENCL
AD FOR PLANT SYSTEMS**W/ENCL
REACTOR SAFETY BR**W/ENCL
VOLLMER/BUNCH**W/ENCL
POWER SYS BR**W/ENCL

EXTERNAL:

LPDR'S
FT PIERCE, FL**W/ENCL
TIC**W/ENCL
NSIC**W/ENCL
ACRS CAT B**W/16 ENCL

A/04

DISTRIBUTION: LTR 45 ENCL 45
SIZE: 1P+1P+2P

CONTROL NBR: 781870323

***** THE END *****

60

*** MASTER ROSTER ***
*** PUBLICATIONS ***

DIVISION	TITLE	CITY	ORP. TYPE	ST..ZIP	I-----	DISTRIBUTION	CODES	1 - 17	I-----
					I-----	DISTRIBUTION	QTY	1 - 17	I-----
					I-----	DISTRIBUTION	CODES	18 - 34	I-----
					I-----	DISTRIBUTION	QTY	18 - 34	I-----
					I-----	DISTRIBUTION	CODES	35 - 50	I-----
					I-----	DISTRIBUTION	QTY	35 - 50	I-----

	SN	SR	SF	SE	SM	SP	ST	SO	SA	SG	RA
BERKELEY	1	1	1	1	1	1	1	1	1	1	1
CA	94704										

	SN	SR	SF	SE	SM	SP	ST	SO	SA	SG
EXECUTIVE VICE PRESIDENT	1	1	1	1	1	1	1	1	1	1
BERKELEY	CA	94704								

	SE
ANITATION & RADIATION LAB	1
BERKELEY	CA 94704

	SN	SE	ST	SO	SG
BERKELEY	1	1	1	1	1
CA	94704				

	SN	SE	SM	SO	SG
BRARY	1	1	1	1	1
BRARIAN					
BERKELEY	CA	94704			

	CW
ITE 1200	1
CA	94704

	CW
RKELEY	1
CA	94704

	CW
RKELEY	1
CA	94704

	CW
RKELEY	1
CA	94704

	CW
RKELEY	1
CA	94705

	CW
RKELEY	1
CA	94707

REGULATORY DOCKET FILE COPY



June 13, 1978

PRN-LI-78-154

REC
SERVICES
YCH

1978 JUL 3 PM 1 55

REC'D DISTRIBUTION
SERVICES UNIT

Mr. James P. O'Reilly, Director, Region II
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
230 Peachtree Street, N. W., Suite 1217
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

REPORTABLE OCCURRENCE 335-78-17
ST. LUCIE UNIT 1
DATE OF OCCURRENCE: MAY 14, 1978

OFF-SITE POWER

The attached Licensee Event Report is being submitted in accordance with Technical Specification 6.9 to provide 30-day notification of the subject occurrence.

Very truly yours,

A. D. Schmidt
A. D. Schmidt
Vice President
Power Resources

MAS/ms

Attachment

cc: Harold F. Reis, Esquire
Director, Office of Inspection and Enforcement (30)
Director, Office of Management Information and
Program Control (3)

781870323

1002
3/11

LICENSEE EVENT REPORT

CONTROL BLOCK: | | | | | ①

(PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

① | F | L | S | L | S | I | ② | 0 | 0 | 1 | - | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | - | 0 | 1 | 0 | ③ | 4 | 1 | 1 | 1 | 1 | 1 | ④ | | | | ⑤

CONT
① | REPORT SOURCE | L | ⑤ | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 1 | 3 | 3 | 1 | 5 | ⑦ | 0 | 5 | 1 | 1 | 4 | 7 | 1 | 8 | ⑧ | 0 | 6 | 1 | 1 | 3 | 7 | 1 | 8 | ⑨

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES ⑩

① | Improper switching at the Pratt & Whitney Substation, combined with
② | incorrect wiring of protective relays at the Midway Substation, led to
③ | the deenergization of the Midway Substation. This resulted in the loss
④ | of off-site power to the St. Lucie Plant for about 8-1/4 minutes. One
⑤ | on-site diesel generator was out of service for maintenance. The remain-
⑥ | diesel generator started automatically and provided shutdown power until
⑦ | off-site power was restored.

⑧ | SYSTEM CODE | F | L | A | ⑪ | CAUSE CODE | X | ⑫ | CAUSE SUBCODE | Z | ⑬ | COMPONENT CODE | C | K | I | T | B | I | R | K | ⑭ | COMP. SUBCODE | F | ⑮ | VALVE SUBCODE | Z | ⑯

⑰ | LER/RO REPORT NUMBER | 1718 | ⑱ | SEQUENTIAL REPORT NO. | 0117 | ⑲ | OCCURRENCE CODE | 013 | ⑳ | REPORT TYPE | L | ㉑ | REVISION NO. | 0 |

㉒ | ACTION TAKEN | A | ㉓ | FUTURE ACTION | G | ㉔ | EFFECT ON PLANT | Z | ㉕ | SHUTDOWN METHOD | Z | ㉖ | HOURS | 0 | 0 | 0 | 0 | ㉗ | ATTACHMENT SUBMITTED | Y | ㉘ | NPD-4 FORM SUB. | N | ㉙ | PRIME COMP. SUPPLIER | L | ㉚ | COMPONENT MANUFACTURER | G | 1 | 0 | 8 | 1 | 0 | ㉛

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS ㉜

① | The cause was improper switching at the Pratt & Whitney Substation com-
② | bined with incorrect wiring of both 240/138 kV autotransformer polarizing
③ | CT circuits at the Midway Substation. The incorrect wiring has been
④ | corrected, and appropriate personnel have been advised of the cause and
⑤ | corrective action for this occurrence.

① | FACILITY STATUS | H | ② | % POWER | 0 | 0 | 1 | 0 | ③ | OTHER STATUS | NA | ④ | METHOD OF DISCOVERY | A | ⑤ | DISCOVERY DESCRIPTION | Operator Observation

⑥ | ACTIVITY CONTENT | Z | ⑦ | RELEASED OF RELEASE | Z | ⑧ | AMOUNT OF ACTIVITY | NA | ⑨ | LOCATION OF RELEASE | NA

⑩ | PERSONNEL EXPOSURES NUMBER | 0 | 1 | 0 | 0 | ⑪ | TYPE | Z | ⑫ | DESCRIPTION | NA

⑬ | PERSONNEL INJURIES NUMBER | 0 | 1 | 0 | 0 | ⑭ | DESCRIPTION | NA

⑮ | LOSS OF OR DAMAGE TO FACILITY TYPE | Z | ⑯ | DESCRIPTION | NA

⑰ | PUBLICITY ISSUED DESCRIPTION | N | ⑱ | NRC USE ONLY

NAME OF PREPARER M. A. Schoppman

PHONE: 305/552-3802

INTRODUCTION

Florida Power & Light Co. (FPL) experienced an electrical power system disturbance on Sunday, May 14, 1978, which resulted in the loss of power to an area of the FPL system. This blacked out area included the loss of off-site power to St. Lucie Plant for approximately 8 minutes.

Fault recorder records, the West Palm Beach computer printout, and logs were used to reconstruct the sequence of events.

PRE-DISTURBANCE CONDITIONS

Only conditions in affected area are listed:

- 1 - St. Lucie Plant unit No. 1 off for refueling.
- 2 - Pratt & Whitney 240kV ring bus open (240G36835 open) prior to switching. This switch had been previously reported to be arcing. The Dispatcher believed the switch to still be inoperative.
- 3 - Two 240/138kV autotransformers (49-1035 & 49-1168) at Midway Substation were recently installed to replace smaller capacity units.

DISTURBANCE

On Sunday, May 14, 1978, at approximately 7:45AM while switching out the Pratt & Whitney-Ranch 240kV circuit for a routine clearance, a condition was created on the Pratt & Whitney south 240kV bus that caused lightning arresters on this bus to fail destructively.

Hot ionized gas from the lightning arresters caused a "C" phase to ground fault on the Midway-Ranch 240kV circuit which passes directly over the Pratt & Whitney bus.

At Midway Substation improper connection of the relay current polarizing circuit resulted in incorrect operation of the Directional Carrier Ground Relays (CLPG) on the Malabar-Midway 240kV No. 1, Malabar-Midway 240kV No. 2 and the Midway-Plumosis 138kV circuits. Erroneous current polarizing likewise resulted in failure to trip by the ground relays of the Midway terminal of the faulted Midway-Ranch 240kV circuit. Failure of this terminal to trip resulted in a back-up operation of the autotransformer tertiary relay at Midway Substation.

The Hartman-Midway and Okeechobee-Midway lines then tripped, interrupting service to St. Lucie and other stations. On-site power was supplied at St. Lucie by automatic diesel generator operation. St. Lucie remained on diesel power until after system conditions stabilized.

For given phase to ground fault, the north autotransformer tertiary relay is more sensitive than the south autotransformer tertiary relay. This accounts for the operation of only the north autotransformer tertiary relay.

The two main contributing factors to the power loss were:

- 1 - Improper switching at Pratt & Whitney Substation.
- 2 - Improper connection of both 240/138kV autotransformer polarizing CT circuits at Midway Substation.

RESTORATION

Several attempts were made to energize the north bus at Midway Substation via the Malabar 240kV No. 2 circuit. However, the lockout relay previously tripped by the tertiary relay had not been reset. The south bus at Midway Substation was energized via the Ranch 240kV circuit.

As switching continued to normalize the system, a breaker at Pratt & Whitney was closed and the original lightning arrester problem was recreated. This resulted in the deenergizing of Midway Substation.

Final reenergization of Midway Substation and St. Lucie Plant was accomplished by the closing of the Ranch 240kV circuit at 7:53:30.

This resulted in the loss of off-site power to St. Lucie Plant for approximately eight minutes and sixteen and one-half seconds.

Switching was then carried out until the entire affected area was returned to normal with the exception of Midway Substation's north autotransformer.

CORRECTIVE ACTIONS

- 1 - The improper polarizing at Midway Substation has been corrected.
- 2 - The north and south buses at Pratt & Whitney Substation have been tied together to avoid the bus high voltage problem encountered during switching.
- 3 - Drawings in use at the time were reviewed and an error was detected. As a result of this, System Protection Memorandum No. 3.10.1-A titled "The Connection of CT's In An Autotransformer When Used As a Source For Ground Polarizing Circuit" was issued May 22, 1978. This memorandum outlines the procedures for checking transformer nameplate data against FPL drawings as well as the electrical tests which are to be made. This memorandum will be incorporated into the Power Supply Procedures Manual and will prevent a recurrence of this event.
- 4 - System Operators and Dispatchers have been advised of the hazards of an ungrounded delta.